REMARKS

Claims 1-32 are pending. The specification has been amended. Claims 1, 4, 6, 7, 9, 10, 17, 20, 22, 23, 27, 29, and 30 have been amended. No new matter has been added by way of this amendment. Reconsideration of the application is respectfully requested.

The specification has been objected to by the Examiner. In response to the objection, Applicants have amended the specification in a manner that is believed to rectify the discrepancy raised by the Examiner. Accordingly, reconsideration and withdrawal of the objection are respectfully requested.

Claims 1, 4, 17, and 20 have been objected to by the Examiner. In response to the objections, Applicants have amended the claims in a manner which is believed to resolve each specific objection. Accordingly, reconsideration and withdrawal of the objections are respectfully requested.

Claims 1-32 stand rejected under 35 U.S.C. §112, 2nd ¶, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In response to these rejections, Applicants have amended the claims in a manner which is believed to resolve each specific rejection. Accordingly, Applicants believe that the claims are now definite and therefore, reconsideration and withdrawal of all the rejections under 35 U.S.C. §112, 2nd ¶ are respectfully requested.

Claims 1, 2, 4, 6, 17, 18, 20, and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,042,460 to *Sakurai* et al. in view of JP Patent No. 06-003305 to *Senda* et al., while claims 3, 5, 19, 17, and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the combination of these references, and in further view of U.S. Patent No. 6,019,775 to *Sakurai*. In response to these several grounds of rejection, Applicants have amended independent claims 1 and 17 to emphasize those features of the invention that distinguish it from the cited reference. Accordingly, for the reasons set forth hereafter, Applicants respectfully submit that all claims of record now distinguish over the cited references.

Independent claims 1 and 17 each recite the step of "obtaining impedance magnitude data for the hand piece/blade while continuously driving the hand piece/blade with the drive signal."

U.S. Patent No. 5,042,460 to *Sakurai* et al. relates to an ultrasonic apparatus which includes an impedance detection unit for detecting the impedance of an ultrasonic vibration element which is used for transmitting ultrasonic vibrations, and a determining unit for determining whether the ultrasonic vibration element is good. The *Sakurai* et al. patent fails to teach the present invention as set forth in amended independent claims 1 and 17, i.e., the step of "obtaining impedance magnitude data for the hand piece/blade while continuously driving the hand piece/blade with the drive signal."

Set forth on page 6 thru 7, paragraph 6 of the Office Action is the statement:

> Sakurai discloses an ultrasonic treating apparatus with a device for inhibiting drive when the ultrasonic element is determined to be defective

> comprising applying a drive signal to an ultrasonic hand piece/blade using an ultrasonic generator (column 3, lines 7-19), ***obtaining impedance data for the hand piece/blade (column 3, lines 25-28)*** comparing the impedance data to determine whether the impedance data is within acceptable limits (column 4, lines 35-39) and if the impedance is within acceptable limits, ***displaying a message on a display of the generator*** (column 4, lines 40-42).
>
> ...
>
> Senda teaches a method for non-destructively inspecting a piezoelectric element for a micro-crack...
>
> It would have been obvious to one having ordinary skill in the art to modify the invention of Sakurai to teach a method for determining a crack in the device as compared to a known/ideal device, as taught by Senda, because the combination would have provided a method for determining the occurrence of a physical defect thereby allowing the user to correctly diagnose and correct the problem and, as suggested by Senda, provided precise diagnostics quickly, automatically, and without destroying the device under test (0005-0007).
>
> Although the invention of Sakurai and Senda discloses performing the comparison to determine a crack in the transducer rather than the blade itself, since the blade and transducer are attached a change in impedance due to a crack in the blade would also correspond to the change in impedance observed by the current method (See, for example, page 4, lines 7-16 of the Background of the instant invention that describes the grouped frequency response of the transducer and blade and the correlation between the electric parameters of the transducer and the blade response). Therefore, the combination of Sakurai and Senda operates in a method that determines the change in impedance indicating a crack in the transducer or the connected blade. [Emphasis Added]

With respect to the foregoing, however, Applicants wish to point out the following. First, with reference to Fig. 3 of the *Sakurai* et al. patent, an "impedance detection circuit 11" is shown separate from the "drive circuit 5." In addition, a "change over circuit 6" is also shown. With this configuration, the system disclosed in *Sakurai* et al. can only measure and conclude whether the probe is "good or bad" prior to, or after, operation of the scalpel. In this system, the change over circuit 6 must be used to switch between the impedance detection circuit 11 and the

drive circuit 5 in order to perform impedance measurements or to drive the hand piece with the drive signal. As a result, the hand piece of the *Sakurai* et al. patent will be activated even if it is cracked, and will continue to be driven even it if it becomes cracked during use. This is a dangerous mode of operation.

In contrast, the impedance circuit and the detection circuit of the present invention are combined. As a result, the hand piece/blade of claimed system may be continuously driven, while the impedance measurements are being performed. Using the method set forth in amended claims 1 and 17, the blade will be deactivated immediately if it cracks while active, i.e., while being driven. This is a safer mode of operation than continuing to drive the blade with no real-time knowledge of the status of the blade. This ability is reflected in claims 1 and 17 as amended, wherein the hand piece/blade is continuously driven with the drive signal while the impedance magnitude data for the hand piece/blade is obtained. For at least this reason, Applicants respectfully assert that the *Sakurai* et al. patent fails to teach the invention as set forth in amended claims 1 and 17.

Second, the *Sakurai* et al. patent fails to disclose the concept of "differentiating between burdened and cracked ultrasonically tuned blades." *Sakurai* et al. only sets a "go-no-go criteria" (i.e. determine whether the scalpel can be safely activated or not) for the system and fails to mention the determination of whether the probe 4 (i.e., the blade as illustrated and claimed in the present invention) is good or cracked. In contrast, amended claims 1 and 17 are directed to determining whether the blade is okay, i.e., the blade is not cracked or simply burdened with gunk. Accordingly, for this additional reason, Applicants respectfully assert that the *Sakurai* et al. patent fails to teach the present claimed invention.

JP Patent No. 06-003305 to *Senda* et al. has been introduced to cure the deficiencies of the *Sakurai* et al. patent. This patent relates to a method for non-destructively inspecting piezo-electric elements for micro-cracks for a quick, automatic discrimination of the presence/absence of micro-cracks in a piezo-electric element with a high level of accuracy (see Purpose Statement of the patent abstract). In this patent, a pzt ring/disk (i.e. the piezo-electric element) is inspected by (1) sweeping the frequency around a ring's resonance and taking impedance measurements (magnitude and phase); (2) constructing both magnitude and phase graphs; and (3) comparing the magnitude and phase plots to graphs of good rings to determine if the ring is acceptable. In short, this publication is directed to determining whether rings are okay.

In contrast, the present invention as set forth in amended method claims 1 and 17 is directed to determining whether blades/probes that are inserted into a hand piece are good. The method disclosed in the *Senda* publication is different than what is set forth and claimed in Applicants' amended independent claims 1 and 17. This patent fails to teach, *inter alia*, the step of "obtaining impedance magnitude data for [a] hand piece/blade while continuously driving the hand piece/blade with [a] drive signal." As a result, the system achieved by the combination of the *Senda* publication and the *Sakarai* et al. patent fails to achieve the invention as set forth and claimed in independent method claims 1 and 17.

U.S. Patent No. 6,019,775 to *Sakurai* ("*Sakurai* '775") relates to an ultrasonic apparatus which performs treatments by utilizing an ultrasonic oscillation, and comprises a hand piece serving as a surgical tool and an apparatus body including a power source unit for supplying electric power to the hand piece (see A*bs.*). However, this patent fails to cure the deficiency of the system comprising the *Sakurai* et al. patent and the *Senda* et al. reference. Specifically, *Sakurai* '775 also

fails to teach the step of "obtaining impedance magnitude data for [a] hand piece/blade while continuously driving the hand piece/blade with [a] drive signal." Therefore, Applicants respectfully assert that the combined references, whether considered individually or in combination, fail to teach or suggest the invention as set forth in amended independent claims 1 and 17. Accordingly, independent claims 1 and 17 are patentable over the combination of the *Sakurai* patents and the *Senda* et al. reference.

In view of the patentability of amended independent claims 1 and 17, for the reasons above, dependent claims 2-16 and 18-32 are also patentable over the prior art.

Based on the foregoing amendments and remarks, this application should be in condition for allowance. Early passage of this case to issue is respectfully requested. However, if there are any questions regarding this Response, or the application in general, a telephone call to the undersigned would be appreciated since this would expedite the prosecution of the application for all concerned.

Dated: June 28, 2004

Respectfully submitted,

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